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Dimensions, magnitude and personal antecedents of Organizational Citizenship Behavior among a slice of health professionals in an Egyptian context

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ABSTRACT

Organizational Citizenship Behavior (OCB) is becoming a focus of universal extensive research. Twenty-four itemed Podsakoff et al.'s (1990) OCB questionnaire has been used as an initial item pool to develop an OCB concept measurement model. The study was performed on healthcare professionals conducting their postgraduate studies at High Institute of Public Health, Alexandria University, Egypt. Four successive samples (S1, S2, S3, & S4) were collected one month apart. Preliminary screening procedures revealed that eighteen items were not suitable for factor analysis and were screened out. Six items that survived the screening process were subjected to exploratory factor analysis which disclosed a bifactorial model with three indicators loading on each factor. These initial results were cross-validated through carrying out CFA on a second sample S2 that clarified the factorial validity of the model through adequate global and local fit indices. The model displayed adequate convergent and discriminant validities. The model satisfied the condition of tau-equivalence while parallelism was not fulfilled. Test-retest reliability across consecutive administrations was verified. Multiple-group CFA authenticated model's invariance across S1 & S2. Temporal invariance of the OCB model was established through verifying model's invariance through four sequential samples S1, S2, S3 & S4. Moreover, the model was invariant across various categories of participants' personal attributes including age, gender, marital status, undergraduate merit, tenure, postgraduate program, profession and work sector. All through the study four successive levels of invariance have been ratified. Weighted rather than equal indicator scoring has been used to calculate OCB scale and subscale

magnitudes which demonstrated a moderate level of OCB together with its two dimensions, namely, "Civic virtue" and "Conscientiousness". No association has been displayed between OCB and participants' personal characteristics. Based on study findings:- recommendations, managerial implications, future research directions, and limitations have been underscored.

Keywords: Organizational Citizenship Behavior; Exploratory factor analysis;Confirmatory factor analysis; Measurement invariance;Temporal stability; Personal antecedents;Healthcare professionals; Egypt

INTRODUCTION

Recently, the concept of Organizational Citizenship Behavior (OCB) as a positive, pro-organizational behavior is becoming a target of extensive research and a focus of enormous managerial concern counting healthcare organizations (Chahal& Mehta, 2010; Dargahi, Alirezaie, &Shaham, 2012; Jena & Goswami, 2014; Robbins & Judge, 2007). OCB has been defned as voluntary, extra-role; discretionary consensual employee efforts that surpass formal job description and go beyond the call of duty to upsurge organizational functioning (Barnard, 1938; Bateman & Organ, 1983; Katz & Kahn, 1966; Organ, 1988, 1997). OCB come in diverse shapes and forms, and current literature has counted over forty distinct sorts of OCB acts (LePine, Erez, & Johnson, 2002).

OCB is manifested by actions entwined with consideration, magnanimity, forgiveness, civility, assisting coworkers, participating in administrative meetings, withstanding trivial organizational inconveniences, following instructions, taking on additional assignments, keeping up with developments in one’s profession, attending extra-training sessions, promoting organization image, protecting organization's resources (including time), and willing abiding by organization rules (Appelbaum et al., 2004; Bolino&Turnley, 2003; Kidwell, Mossholder, & Bennett, 1997; Podsakoff, Mackenzie, Paine, &Bachrach, 2000; Turnipseed&Rassuli, 2005). On the aggregate these actions promote organizational performance (Bateman & Organ, 1983). Handful -virtually synonymous- terms

are used to describe OCB behaviors, including: employee citizenship behavior, civic citizenship, extra-task behavior, extra-role behavior, employee's social behavior, pro-social behavior, organizational spontaneity, and contextual performance (Borman & Motowidlo, 1993; Brief & Motowidlo, 1986; George & Brief, 1992; Graham, 1989, 1991; Mehdizadeh, Tavakoli, Salajeghe, &Sheikhi, 2018; Van Dyne, Cummings, & Parks, 1995). Health administrators and policymakers have realized the implications and significance of OCB, and make efforts to attract and retain health workers exhibiting it (Dargahi et al., 2012).

A sizeable number of studies analyzed the nature, measured the magnitude, specified the antecedents, and described the consequences of OCB in various contexts including healthcare milieus (Argentero, Cortese, &Ferretti, 2008; Lievens &Anseel, 2004). It is proposed that OCB leads to greater organizational social capital, which in turn improves organizational performance (Bolino, Turnley, & Bloodgood, 2002). Sequels of OCB include improved productivity, efficiency, profitability, creativity, customer satisfaction, and employee satisfaction (Bolino et al., 2002; Chiu & Tsai, 2007; Jan &Gul, 2016; Morrison, 1994; Podsakoff, Whiting, Blume, & Podsakoff, 2009). Within healthcare sector it was demonstrated that OCB enhances performance, service quality, commitment, patient satisfaction, employee retention and corporate image (Bahrami, Montazeralfaraj, Gazar, &Tafti, 2014; Chahal& Mehta, 2010; Desselle&Semsick, 2016; Kolade, Oluseye, &Omotayo, 2014; Sevi, 2010; Yaghoubi, Salehi, & Moloudi, 2011).

A plethora of research has reflected the idea that OCB is context-specific and several researchers have developed their own instruments to measure OCB in assorted scenes (Deckop, McClendon, & Harris-Pereles, 1993; Desselle & Semsick, 2016; Latham & Skarlicki, 1995; Podsakoff et al., 2009; Somech & Drach-Zahavy, 2000; Turnley, Bolino, Lester, & Bloodgood, 2003; Van Dyne & LePine, 1998; Williams & Anderson, 1991). Scholars hold different views with respect to the dimensionality of OCB and there is no consensus among researchers regarding the number of dimensions of OCB (Khiabani, Abdizadeh, & Baroto, 2014; Yaghoubi et al., 2011). An original five-dimensional model

comprised of "Civic virtue" (participating in the governance of the organization), "Conscientiousness" (carrying out duties beyond the minimum requirements), "Sportsmanship" (refraining from complaining about trifling matters), "Altruism" (helping coworkers), and "Courtesy" (alerting colleagues about changes that may affect their work) was proposed by several authors (Bateman, & Organ, 1983; Danaeefard, Balutbazeh, &Kashi, 2010, Dimitriades, 2007; Organ 1988, 1991; Organ, Podsakoff, & MacKenzie, 2006; Podsakoff, Mackenzie, Moorman, & Fetter, 1990). In a similar vein, Hannam and Jimmieson (2002) considered OCB to be function of five dimensions, namely, "Civic virtue", "Conscientiousness", "Altruism", "Organizational Compliance" (acquiescence with laws, procedures, and standards), and "Individual Initiative" (taking timely decisions). However, a five-dimensional model is not invariable, and fewer dimensions have been reported.

Graham (1989); and Moorman and Blakely (1995) derived a measure of OCB comprised of four dimensions, namely, "Interpersonal helping", "Individual initiative", "Personal industry", and "Loyal boosterism" (enthusiastic support). According to Van Dyne, Graham, and Dienesch (1994), the framework of OCBs includes four dimensions namely, "Social participation", "Loyalty", "Obedience", and "Functional participation". A study on Chinese physicians (Han, Wei, Li, Zhang, & Li, 2018); and another one on Iranian nurses (Dargahi et al., 2012) demonstrated four dimensions, explicitly, "Conscientiousness", "Sportsmanship", "Civic virtue", and "Altruism". Morrison (1994) proposed a hypothetical structure of OCB comprised of four dimensions explicitly, "Altruism", "Conscientiousness", "Involvement", and "Keeping up with Changes".

On the other hand, the three dimensions of "Civic virtue", "Helping behavior", and "Sportsmanship", were supported by MacKenzie, Podsakoff and Fetter (1991, 1993); Podsakoff and MacKenzie (1994); and Podsakoff, Ahearne and MacKenzie (1997). "Civic Virtue", "Conscientiousness" and "Altruism" have been endorsed by Argentero et al., 2008; and Islam, Ahmed, Ahmed, and Mohammad, 2012. "Altruism", "Courtesy", "Sportsmanship" have been maintained by Petitta, Borgogni, Mastrorilli, &Scarpa, 2004 as cited by Argentero et al., 2008. In a similar vien, Al-

Zu‟bi (2011) used three factors of OCB, i.e. "Sportsmanship", "Conscientiousness", and "Altruism". Similarly, Coleman and Borman (2000) proposed three dimensions: "Interpersonal citizenship performance", "Organizational citizenship performance", and" Job/Task citizenship performance".

Nevertheless, Borman, Penner, Allen, and Motowidlo (2001) maintain that OCB is comprised of two dimensions, "Conscientiousness" and "Altruism". Relatedly, Van Scotter and Motowidlo (1996) distinguished the two factors of "Interpersonal facilitation"and" Job dedication". Kim (2006); and Smith, Organ, and Near (1983) have conceptualized OCB with the two dimensions of "Altruism" and "Generalized compliance". Marokzy&Xin (2004) also supported two dimensions, specifically, "Sportsmanship" and "Courtesy". In an Iranian healthcare milieu, Khiabani et al., 2014 concluded that there are two dimensions for OCB namely, "Civic virtue" and "Altruism". Organ (1997); and Williams & Anderson (1991) conceptualized the two dimensions of OCB as OCB-I (i.e. behaviors directed toward individuals' benefit; and OCB-O (behaviors directed toward organization's benefit.

However, a number of researchers maintained that there is an inevitable overlap between the various components of OCB and advocated the use of a one-dimensional or overall OCB measure (e.g., Decktop, Mangel, & Circa, 1999; George & Brief, 1992).Two recent meta-analyses alluded that current operationalizations of OCB are best viewed as indicators of a general OCB factor and it is likely that little is to be gained through the use of discrete dimensional measures as opposed to an overall composite measure (DiPaola&Tschannen-Moran, 2001; Hoffman, Blair, Meriac, &Woehr, 2007; LePine et al., 2002).

It is argued that organizations become more successful as more personnel display OCB (Yen & Niehoff, 2004).Possibly some staff will be more inclined towards engaging in OCB than others (Zhang, 2011). Research proposes that individual personal traits may be important antecedents of OCB (Chien, 2003; Lievens & Anseel, 2004). Personal individual antecedents of OCB may include age, gender, educational level, marital status, tenure, and job standing (Brief &Motowidlo, 1986; Chahal& Mehta,

2010; Gregerson, 1993; Hazzi&Maldaon, 2012; McLean & Kidder, 1998; O'Reilly & Chatman, 1986; Organ, 1988; Penner, Dovidio, Piliavin, & Schroeder, 2005; Podsakoff et al., 2000; Russell & Rush, 1987).

Brief and Motowidlo (1986) mentioned that age, tenure, gender, and educational level are personal characteristics that might predict OCB. Past studies have demonstrated that the relationship between OCB and personal chatacteristics of employees is generally weak, inconclusive or inconsistent (Jena &Goswami, 2014; Organ &Konovsky, 1989; Organ & Ryan, 1995; Smith et al., 1983).Then again, OCB is beneficial to organizations and its antecedents are required to be considered even if the influence of personal factors on tendency to exhibit OCB is not yet well-established (Zhang, 2011). Smith et al. (1983) found that OCB is positively correlated with educational level. It is claimed that employees with higher educational levels would perceive their exchange with the organization as more social than calculative.Such employees would more readily acknowledge the importance of informal support of their co-workers and supervisors (Jena, &Goswami, 2014).A study by Decktop et al., (1999) brought forth that employee's age had a negative and significant effect on OCB. It is argued that younger employees coordinate their needs with organizational needs more flexibly, whereas, older employees tend to be more rigid in adjusting with the organizations' needs (Chahal& Mehta, 2010). Russell and Rush (1987) found some relationship that the unmarried are more disposed to parade OCB behaviors than married employees. They envisagd married employees to have less time and energy to assign to extra-role activities, so as to devote this time to their families; while, unmarried employees have more time and energy for extra-role activities.

Although OCB's dimensins, measurement and personal antecedents - have been extensively studied in developed countries, such analyses have received relatively limited attention in other international contexts (Farh, Early, & Lin, 1997; Lievens & Anseel, 2004). Lately OCB has been barely studied in non-Western contexs such as China, Taiwan, Hong Kong, Singapore, Australia, and

Japan (Chen, Hui, & Sego, 1998; Hui, Law, & Chen, 1999: Lam, Hui, & Law, 1999; Tang, Furnham, & Davis, 2002; Van Dyne & Ang, 1998). Still, studies conducted in non-Western contexts are very limited (Jena & Goswami, 2014).Considering the import OCB in the new challenging and changing today's corporate world the purpose of the present study is to explore the dimensions, magnitude and personal antecedents of OCB in a slice of health workers in an Egyptian context. The present study gratifies a research lacuna about OCB among a slice of health workers in Egypt. To the extent of the researcher's knowledge no similar research has been carried out on such a workforce segment in Egypt. Moreover, the present study contributes to augmenting the cross-cultural meaningfulness and applicability of the concept of OCB and aims at studying a hypothesized relationship between employees' personal characteristics and level of OCB.

METHODS

An observational analytical cross-sectional study was conducted among diploma and master health professionals carrying out their postgraduate studies at the High Institute of Public Health (HIPH), Alexandria University, Egypt. Permission was obtained from authorities and Ethics Committee of HIPH on 24/9/2019 and data collection was conducted in the period from 29/9/2019 till 16/1/2020. Participation was voluntary and verbal informed consent was obtained from study participants.The purpose of the study was explained and participants were assured about the confidentiality and anonymity of the collected data. Participants were labeled by a scholar identification number. The researcher complied with the International Guidelines for Research Ethics and Academy of Management Code of Ethics. A specifically designed self-administered questionnaire was delivered in English to all health workers studying in diploma and master programs at HIPH. English proficiency is a prerequisite to enroll as a scholar in HIPH. Four samples were collected one month apart and were designated S1, S2, S3, and S4 respectively. Number of participants in initial sample (i.e. S1) was 238 (i.e. $N_1 = 238$) embracing all available health professionals who consented to participate in the study, yet, four scholars did not participate,

comprising a response rate of 238/242 i.e., 98.35%. Number of participants in the second sample (i.e., S2) was 208 giving a response rate of 208/242, i.e. 85.95%. Number of participants in the third sample (i.e., S3) was 190 giving a response rate of 190/242, i.e. 78.51%.Then the number of participants in the fourth sample (i.e., S4) was 169 contributing a response rate of 169/242, i.e. 69.83%. Participation rate of 70% is considered remarkably acceptable (Galea & Tracy, 2007).

The study questionnaire contained three sections. The first section introduced the researcher to the participants, informed them of the purpose of the study and submitted instructions about how to complete the questionnaire.The second section encompassed items pertaining to selected personal characteristics of participants including age; gender; marital status; year of undergraduation; attained undergraduate merit (excellent, very good, good, and satisfactory); postgraduate study program (master or diploma); work sector [Ministry of Health (MOH); University, Private, and others]; professional category (physician, pharmacist, dentist, nursing, nutritionist, others); tenure (years of experience); and the scholar identification number. The third section encompassed the 24 items of Podsakoff et al.'s (1990) OCB questionnaire which has acknowledged reliability and validity (Argentero, et al., 2008; Podsakoff et al., 1990).The aforementioned scale was used as an initial item pool to develop a measuring tool suitable for assessing the dimensionality of OCB and measuring its magnitude in the study situation.

Twenty-four OCB acts (observed variables/indicators/items) of Podsakoff et al's (1990) scale are given with their initial codes as used in the present study:- :**{**OCB1}"I help others who have heavy workloads"; **{**OCB2}I do my job without constant requests from my superior; **{**OCB3}"I believe in giving an honest day's work for an honest day's pay", **{**OCB4}"I do not consume a lot of time complaining about trivial matters"; **{**OCB5} "I try to avoid creating problems to other coworkers"; **{**OCB6}"I keep abreast of changes in the organization"; **{**OCB7}"I do not tend to make mountains out of molehills"; **{**OCB8}"I consider the impact of my actions on coworkers"; **{**OCB9}"I attend meetings that are not mandatory, but are considered important"; **{**OCB10}"I am always ready to lend a helping hand to those around me"; **{**OCB11} "I attend functions that are not required but help the organization image";

{OCB12}"I read and keep up with organization announcements, memos, and so on"; **{**OCB13}"I help others who have been absent"; **{**OCB14}"I do not abuse the rights of others"; **{**OCB15} "I willingly help others who have work related problems"; **{**OCB16} "I always focus on what's wrong, rather than the positive side"; **{**OCB17}"I take steps to try to prevent problems with other personnel"; **{**CB18}"My attendance at work is above norm"; **{**OCB19}"I always find fault with what the organization is doing"; **{**OCB20}"I am mindful of how my behavior affects other people's jobs"; **{**OCB21} "I do not take extra breaks"; **{**OCB 22} "I obey organization rules and regulations even when no one is watching"; **{**OCB 23}"I help orient new people even though it is not required"; **{**OCB24} "I am one of the most conscientious employees". Respondents were asked to indicate - on a seven-point Likert scale- the extent to which they agreed/disagreed with each of the 24 items, according to the following categories: *"Always"*, *"Usually"*, *"Commonly"*, *"Sometimes"*, *"Rarely"*, *"Very rarely"*, and *"Never"*. Respectively, these categories were accorded a score from seven to one; where higher item score indicates a higher (i.e. better) level of OCB.On this basis the level of measurement is considered as an interval scale suitable for correlational analyses.

Preliminary screening (including, recognition of quantity and pattern of missing data, item analysis, internal consistency, detection of multicollinearityand sampling adequacy analysis) of the 24-item dataset was carried out to assure suitability of the four datasets (i.e., S1, S2, S3, & S4) for conducting factor analysis (FA). Cases with more than 10% missing data would be excluded; otherwise missing data showing a random pattern would be replaced with imputed variable mean. Results obtained with imputed variable mean technique would be compared with listwise deletion technique. A subjects-to-variables ratio ≥ 5 is an indication of sufficient sample size (Bryant &Yarnold, 1995). Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy more than .7 is considered adequate (Cerny& Kaiser, 1977). KMO for individual items i.e. measures of sample adequacy (MSA) > 0.5, are considered acceptable (Field, 2009). A significant Bartlett's test of sphericity signified that correlations between scale items were sufficiently sizeable for FA (Sharma, 1996). A variance inflation factor (VIF) < 10

indicates no multicollinearity problem with the indicator dataset (Allison, 1998). A determinant >0.00001 denotes that the interitem correlation matrix is not an identity matrix and that there are no multicollinarity or singularity problems with the dataset (Morgan, &Griego, 1998). A Chronbach's alpha > .7 denotes internal consistency reliability of the scale (Nunnally, 1976), though, a Cronbach's α value of .5 is considered legitimate and acceptable with a short scale (Dall'Oglio et al., 2010).

An item would be removed from the scale if one of the following provisions is furnished:- Chronbach's α if-item-deleted > Chronbach's α for the 24-item dataset; item having < .3 correlation with all other items; item having corrected item-total correlation (CITC) < .3 (Nunnally & Bernstein, 1994); skweness or kurtosis parameter > 1 (Hair, Black, Babin, Anderson, & Tatham, 2006; Huck, 2008); communality score < 0.2 (Child, 2006). Such items reduce scale's homogeneity, do not benefit extraction of shared variance and did not effectively contribute to measuring the concept (Ferketich, 1991). Mean interitem correlation (MIC) in the range .15 to .5 is acceptable for FA (Clarke&Watson, 1995). Bivariate linearity assumption would be assured through examining intercorrelation coefficients among observed variables in addition to visual inspection of all bivariate scatterplots. Multivariate outlying cases would be detected and excluded using Mahalanobis distance for a case at .001 level of significance. Mardia's coefficient standardized value < 5.00 is indicative of non-violation of the assumption of multivariate normality (Bentler, 2005).

Exploratory factor analysis (EFA) using Principle Axis Factoring (PAF) and promax rotation would be carried out to explore the underlying factor structure of dataset-S1. Cross-loading items (i.e. item loadings > .35 for two or more items), and items with loading < .3 would be eliminated (Costello, A.B. & Osborne, J.W., 2005). If items are eliminated in the EFA, the analysis would be repeated with the retained items (Izquierd, Olea, &José Abad, 2014).Kaiser Criterion (i.e. eigenvalues > 1), screeplot, and parallel

analysis would be used to determine the number of factors to be extracted. A number of factors accounting for half of variability (about 50 % of explained variance) are deemed satisfactory (Tabachnick & Fidell, 2007).

The resulting model would be checked using confirmatory factor analysis (CFA) on S2 via structural equation modeling (SEM). Preliminary screening and assuring the suitability of the dataset S2 for FA would go along the same lines used for dataset S1, however, S2 would not be subjected to EFA and was only employed for CFA through SEM.

Overall model fit would be assessed using eight fit indices, explicitly:- χ^2 ($p > .05$), normed fit index (χ^2/df) < 2, Standardized Root Mean Square Residual (SRMR< .08), Root Mean Square Error of Approximation (RMSEA< .08) with 90 % confidence interval (C.I.lower bound < .05 and upper bound < .10, *p-close* (i.e. p of close fit) > .05. Comparative Fit Index (CFI), Tucker-Lewis index (TLI), Incremental Fit Index (IFI) values > .95 denote good fit and values > .9 denote an acceptable fit. Standardized covariance residuals < |4.0| denote an adequate local model fit (Groenland & Stalpers, 2012). Additionally the normal Q-Q plot of the standardized covariance residuals would be carried out to assess adequacy of local model fit (Groenland & Stalpers, 2012).Convergent validity would be appraised using Cronbach'sα > .5 for each factor, factor loadings > .35, average variance extracted (AVE) > .5 and composite reliability (ρ*c*) > .7. Discriminant validity would be appraised using interfactor correlation <|.85| and (ρ*c*) ≥ (AVE) values of each factor. The detected model would be investigated for the conditions of tau-equivalence (i.e. equal factor loadings) and parallelism (i.e. equal error variances).

Model's invariance across two samples (S1 & S2) would be tested through four progressive levels, scilicet, configural [i.e. equivalent item-factor structures between

groups], metric [i.e. equivalent unstandardized factor loadings (λs) between groups], structural covariance [i.e. equivalent factor covariance], and full residual [i.e. equivalent error term variances between groups]. These models were sequentially labeled {Model A}, {Model B}, {Model C}, and {Model D}.Chi-square difference test (χ^2_{diff}), typically at .001 level of significance and ΔCFI would be used to compare these hierarchically nested models where ΔCFI < .02 was considered statistically insignificant (*ns*).Temporal invariance of the OCB scale would be investigatedby means of testing measurement invariance across four samples S1, S2, S3, & S4 taken at four different points in time. Model's invariance across gender, postgraduate program, marital status, undergraduate merit, age, work sector, tenure, and profession was also scrutinized, after assuring the suitability of S3 and S4 for FA procedures.

Instrument's test-retest reliability (r_{tt}) was determined through assessing stabilityof OCB scores between each administration and its successor, i.e. $(r_{tt})_{S1-S2}$;$(r_{tt})_{S2-S3}$; and $(r_{tt})_{S3-S4}$; respectively whereby(r_{tt}) > .50would be considered acceptable.

The validated measurement model was used to assess the level of OCB among S1 participants.Total participant overall CB score was calculated as the sum of weighted scores of all indicators in the validated measurement model. Average participant overall OCB score was calculated by dividing overall participant OCB score by the number of indicators in the measurement model. Participants with an average overall OCB score of < 2 were reckoned as exhibiting low level of OCB; participants with an average overall OCB score of ≥ 2 to 5 were considered as exhibiting moderate level of OCB; and participants with an average overall OCB score of > 5 were contemplated as displaying high levels of OCB.Additionally, the validated measurement model was used to determine the level of each dimension of OCB. Total participant dimension score was calculated as the sum of weighted scores of the items

reflecting the dimension. Average participant dimension score was calculated by dividing total participant dimension score by the number of indictors specified to each dimension. Participants with an average dimension score of < 2 were reckoned as exhibiting low level of the pertinent dimension; participants with an average dimension score of ≥ 2 to 5 were considered as displaying moderate level of the dimension; participants with an average dimension score of > 5were regarded as exhibiting high OCB on the respective dimension.

Student's t-test and Pearson's correlation coefficient were used to test the statistical significance of differential OCB magnitude corresponding to specified participants' personal characteristics.

Data analysis was conducted using Statistical Package of Social Sciences- Version 25 (SPSS.25) and Excel 2010. SEM was conducted using the Analysis of Moment Structures-Version 25 (AMOS.25). Parallel Analysis (PA) was conducted using Parallel Analysis Calculator devised by Department of Obstetrics and Gynecology affiliated to the Chinese University of Hong Kong & New Territories East Cluster; available at: http://www.obg.cuhk.edu.hk/ResearchSupport/StatTools/ParallelAnalysis_Exp.php.

RESULTS

Personal characteristics of participants in (S1) are shown in table 1. About three-fourths of participants (73.5%) were females. Most participants (92%) were in the age category from 22 to < 40 years. More than half of study subjects (55.9%) were married. The majority of participants (60.9%) subscribed to the diploma program; and slightly less than one-half (48.3%) had a "Very Good" merit at the undergraduate stage. Approximately two-thirds (64.7%) worked for MOH. More than half (56.7%) were physicians. The majority (69.8%) had tenure < ten years. About two-thirds (66.3%) graduated in the period from 2010 to 2019.

Analysis of S1 dataset proceeded by detecting that no case omitted more than 10% of the scale items. The degree and pattern of missing data were observed for each variable. The amount of missing data per scale item varied from (0.4 %) to (2.575 %), with an average .988% missing data per case. It was determined that data were missing randomly and missing data were replaced by imputed variable mean. A sample of 238 presents a subjects-to-indicators ratio of 238/24≈ 10 which is considered sufficient for FA. For the 24-item dataset, KMO of sampling adequacy was .789; MSA values ranged between .575 and .878; Bartlett's test of sphericity was significant (Approximate χ^2 = 1321.430, df= 276, p= .000); VIF was < 2 for all indicators; determinant of the interitem correlation matrix was .003 well above the threshold of .00001; Chronbach's α was .740; Chronbach's alphas if-item-deleted were all below .740 except for items OCB4, OCBA7, OCB16, OCB19, whose Chronbach's α if-item-deleted were .752, .759, .751, .745. Items [OCB1, OCB2, OCB6, & OCB18] had iteritem correlations < .3 with all other items. CITCs were < .3 for items {OCB2, OCB4, OCB5, OCB7, OCB 8, & OCB16}. Extraction communalities (using principle components analysis) were > .3. Items {OCB2, OCB3, OCB5, OCB14, OCB15, OCB16, OCB17, OCB22, &OCB23} had a skewness parameter > one.Items {OCB2, OCB3, OCB5, OCB6, OCB8, OCB14, OCB15, OCB17, OCB22, &OCB23}had a kurtosis parameter > one. Thus 16 items, explicitly, OCB1, OCB2, OCB3, OCB4, OCB5, OCB6, OCB7, OCB8, OCB14, OCB15, OCB16, OCB17, OCB18, OCB19, OCB22, & OCB23 were eliminated.

The remaining eight items, namely, OCB9, OCB10, OCB11, OCB12, OCB13, OCB20, OCB21, &OCB24 were retained. Scatterplots of the eight retained items showed an oval shape indicative of central tendency with linear homoscedastic relations signaling the absence of bivariate outliers among these indicators.Interitem correlations ranged between .439 and .083 and MIC was .236.Chronbach's α for the retained eight items was .7. The highest Mahalanobis distance for a case was (32.221). Mahalanobis distances of four cases exceeded the critical $\chi 2$ value ($\chi 2$=26.125; df=8,

p<0.001), signifying four multivariate outlying cases that were removed from further analysis and FA proceeded with retained 234 cases of S1 and EFA was carried out on the retained eight items.Items OCB10 and OCB13 were removed because their item loading were < .3. For the six itemed dataset, a Mardia's kurtosis critical ratioof 3.777 raises no concerns about multivariatenonnormality.

Assuring the assumptions of univariate, bivariate and multivariate normalities, EFA was executed on the retained six items namely, OCB9, OCB11, OCB12, OCB20, OCB21, OCB24 (table 2). Using PAF, two factors were extracted depending on several criteria. Applying Kaiser Criterion, two factors with eigenvalues exceeding one were extracted. The scree-plot of eigenvalues and parallel analysis firmed up the retention of two factors. A fourth yardstick supporting the retention of two factors is that each of them explained more than 10% of variance and collectively these two factors explained 56.3% of variance (table 2). According to the criterion of explained variance a good factor solution is one that explains most overall variance with the fewest number of factors. The retention of two factors is also guided by theory. A two factor solution is interpretable and is consistent with theory. The unrotated PAF solution (table 3) disclosed that six items loadings on the first factor ranged from 0.670 to 0.338 with only one item loading < .4. Unrotared loadings on the second factor ranged from |.071 to .418|, with only one loading >.4. The loadings on one unrotated factor speak of guaranteed coherence among the two factors (Lee, 2012). Still, rotation assists extracted factors to be more interpretable (de Carvalho & Chima, 2014). Oblique rotation was selected because theory and previous research showed that the OCB factors are moderately positively correlated i.e. correlation coefficient > 0.3 (Argentero et al., 2008; Muthuraman& Al-Haziazi, 2017). Factor loading after rotation using promax method and a significant factor criterion of 0.3 are presented in table 3. It is notable that three indicators (A9, A10, and A11) loaded on F1 and the remaining three indicators (A20, A21, and A24) loaded on F2

The present study, illustrated that the two-factors are positively, moderately and significantly correlated (r = 0.443, p < .001, two-tailed. The two latent variables are not highly

correlated indicating that the model does not have too many factors and a two factor solution is a suitable one (Lix, 2007). F1 embraces OCB actions that portend responsible participation in the governance of the organizationand flaunting rational concern about organization life; then it is labeled "Civic virtue". The second factor (F2) incorporates OCB acts aimed at assiduously carrying out one's duties beyond the minimum requirements, paying attention to details and punctuality; then it is labeled "Conscientiousness". The bidimensional model of S1 was dubbed MS1. Identical results were obtained by treating missed data by means of listwise deletion technique.

A cross-validation study (S2) was undertaken to authenticate the bi-dimensional model uncovered in S1.Personal characteristics of study participants in (S2) are shown in table 1. About three-fourths of S2 participants (74 %) were females. Most S2 participants (91.4%) were in the age category from 22 to < 40 years. More than half of S2 subjects (58.7%) were married. The majority of S2 participants (63%) subscribed to the diploma program; and slightly less than one-half (49%) had a "Very Good" merit at the undergraduate stage. Slightly more than two-thirds (68.6%) worked for MOH. More than half (56.3%) were physicians. The majority (≈ 74%) had tenure of < ten years. About two-thirds (64 %) graduated in the period from 2010 to 2019.There were no significant differences between S1 and S2 as regards participants' personal characteristics as flourished by chi-square and t-test values as paraded in table 1.

The degree and pattern of missing data were observed for each variable in S2. The amount of missing scale item data ranged between (0.5 %) to (1.9 %), with an average .480% missing data per case. No case was excluded for exceeding the 10% threshold for missing scale items. It was determined that data were missing randomly and missing data were replaced by imputed variable mean.A sample of 208 presents a subjects-to-indicators ratio of 208/24 = 8.67 which is pondered sufficient. For the 24-item dataset, KMO of sampling adequacy was .799; MSA values ranged between .698 and .889. Bartlett's test of sphericity was significant (Approximate χ^2 = 1444.716, df= 276, p= .000). VIF was < 2 for all 24 indicators. Determinant of the 24 item intercorrelation matrix

was .001 well above the threshold of .00001and indicating absence of multicolliniarity or singularity problems. Chronbach's α was .761 for the 24-item dataset. Chronbach's α if-item-deleted were all below .761 except for items OCB2 whose Chronbach's α if-item-deleted was .821.

For purposes of cross-validation, analysis of S2 was merely restricted to six items comprising the bi-dimensional detected thru EFA in S1.The skewness and kurtosis of these six items were < |1| except items OCB9 and OCB24 whose kurtosis indices were 1.137 and 1.722 respectively, however, a kurtosis index up to |2| could be tolerated (Kline, 2005).Scatterplots of the six items exposed an oval (even cigar) shape indicative of central tendency with linear homoscedastic relations signaling the absence of bivariate outliers among these indicators. Interitem correlations ranged between .477 and .128 and MIC was .332. Chronbach's α for these six items was .738. The highest Mahalanobis distance for a case was (30.474). Mahalanobis distances of five cases exceeded the critical $\chi 2$ value ($\chi 2 = 22.458$; df = 6, $p<0.001$), indicating five multivariate outlying cases that were removed from further analysis.

S2 dataset composed of retained 203 cases was subjected to CFA via SEM to authenticate the two-factor model uncovered in S1. A two-factor model is specified with three indicators {OCB9, OCB11, OCB12} loading on (F1), and three indicators {OCB20, OCB21, OCB24} loading on F2 (see figure 1). The specified model was identified by fixing factor variances and regression weights of error terms to one each, while all other parameters were freely estimated using maximal likelihood estimator (MLE). The model was estimated and a minimum was achieved. CFA results uncovered a satisfactory overall fit of the measurement model.The following fit indices were registered. $\chi^2_{(8)} = 9.286$, p = .319), (χ^2/df) = 1.16, SRMR = .0310, CFI= .994, TLI = .989, IFI = .995, and RMSEA = .028 with 90 % C.I. (lower bound = .000 and upper bound = .089, *p-close* = .651). Correspondingly, local fit was also satisfactory as all standardized regression paths of the measurement model were significant (p < .001, two-tailed) and sizable as they exceeded.45 with a

range of .482 and .692 (table 4). Besides, the correlation between the two factors was moderate .74 and significant, $p < .001$, two tailed. Chronbach's α for the six-itemed model was .737.

Furthermore, checking standardized residual covariances surfaced that the mean standardized covariance residual is (.0049) i.e. ≈ zero, and that the values of standardized covariance residuals range from .000 to |1.598| (i.e. no standardized covariance residual exceeded the cut-off point of |4.0| denoting an adequate local model fit (table 5). Additionally the normal Q-Q plot of the standardized covariance residuals generated an approximately straight line denoting that the residuals are coming from a normal distribution with a mean of zero, a finding that adds extra evidence to the adequacy of local model fit.

Converegnt validity was supported by (i) sizable and significant factor loadings > .45 for all indicators(table 4), (ii) Chronbach's α of.715 and .556 for the F1 and F2 respectively, (iii) AVE of .675 and .557 for F1 and F2 respectively, which are above the conventional limit of .5; and (iv) (ρc) of .716 and .557 for F1 and F2 respectively. It is noted that (ρc) of F2 is below the conventional limit of .7. Nonetheless, convergent validity could be soundly based on a well-fitted model, a latent variable that has a weighty loading on its indicatorsand an acceptable Chronbach's α (Borsboom, Mellenbergh, & van Heerden, 2004).Thence, discriminant validity was supported by a moderate interfactor correlation coefficient of .75 (i.e. < |.85 | and that $\rho c \geq$ AVE for each factor, specifically, ρc >AVE.716 > .675 for F1; and ρc = AVE= .557 for F2.

As the two-factor model of S2 met the condition of congenerity, the investigation ensued to assess its tau-equivalence and parallelism.It was realized that the fit of the tau- equivalent model was not significantly worse than that of the congeneric model. For the congeneric model: $\chi^2_{(8)} = 9.286$, $p = .319$; for the tau-equivalent model: $\chi^2_{(12)} = 14.276$, $p = .283$.; χ^2diff. $= \chi^2_{(12)} - \chi^2_{(8)} = 14.276_{(12)} - 9.286_{(8)} = 4.99_{(4)}$, *ns*. Calculated $\chi^2 <$ critical χ^2, at .001; (i.e., 4.99<18.467). Because tau-equivalence was established, the analysis proceeded to evaluating the condition of parallel

indicators. For the tau-equivalent model: $\chi^2_{(12)} = 14.276$, p = .283; for the parallel model, $\chi^2_{(17)} = 43.342$, p = .000. χ^2diff. $= \chi^2_{(17)} - \chi^2_{(12)} = 43.342_{(17)} - 14.276_{(12)} = 26.066_{(5)}$,significant since calculated χ^2 > critical $\chi^2_{(5)}$, at .001; (i.e., 26.099>20.515), i.e. the condition of parallelism is not met and a weighted rather than equal indicator scores have been advocated. The bidimensional model of S2 was dubbed MS2.

Running CFA on S1 revealed adequate global and local fit for MS1.The following fit indices were registered: - $\chi^2_{(8)} = 9.308$, p = .317), (χ^2/df) = 1.64, SRMR = .0365, CFI = .993, TLI = .986, IFI = .993, and RMSEA = .026 with 90 % C.I. (lower bound = .000 and upper bound = .084, *p-close* = .682). Correspondingly, local fit was also deemed satisfactory since all standardized regression paths of the measurement model were sizable (> .35 limit) and significant (p < .001, two-tailed) and ranged between .388 and .726. Besides, the correlation between the two factors was moderate .512 and significant p < .001, two-tailed. Furthermore, checking standardized residual covariancesexhibitedthat the mean standardized covariance residual is (.074) i.e. approaching zero, and that the values of standardized covariance residuals range from .000 to |1.079| (i.e. all standardized covariance residuals were < |4.0| denoting an adequate local model fit. Additionally the normal Q-Q plot of the standardized covariance residuals generated an approximately straight line representing that the residuals are coming from a normal distribution with a mean of zero, a finding that adds extra evidence to the adequacy of local model fit. Likewise, the model satisfied the condition of tau-equivalence while parallelism was not fulfilled.

MS1 and MS2 were proved invariant through carrying out multigroup-CFA onfour successive levels of invariance, namely, configural, full metric, structural covariance, and residual(table 6).

Configural invariance of MS1 and MS2 is documented by adequate fit indices of the two models. It is notable that (χ^2_{diff}) between MS1 and MS2 was approximately zero. χ^2diff. $= \chi^2_{(8)\,s1} - \chi^2_{(8)\,s2} = 9.308_{(8)} - 9.286_{(8)} = .002$. χ^2_{diff} was not statistically significant (*ns*)as calculated χ^2<critical

χ^2, at .95 probability level and one degree of freedom; (i.e., .002 < .004). Additionally $\Delta CFI = CFI_{S1} - CFI_{S2}$ = .994 -.993 = .001, which is well-below .02 cutoff limit. Configural invariance between MS1 and MS2 was established, and analysis progressed to test for metric invariance.

For MS1 and MS2 metric invariance was established since $\Delta \chi^2$ and ΔCFI for models A & B were not significant, that is to say, the difference of fit of the full metric model was not significantly worse than the configural model (i.e. model A). For the metric model: $\chi^2_{(22)} = 26.069$; for model A: $\chi^2_{(16)} = 18.594$; χ^2diff. $= \chi^2_{(22)} - \chi^2_{(16)} = 26.069_{(22)} - 18.594_{(16)} = 7.475_{(6)}$, *ns*. χ^2_{diff} was not significant as calculated $\chi^2_{(6)}$ < critical $\chi^2_{(6)}$ at .001; (i.e., 7.475 < 22.458), additionally, ΔCFI was zero (see table 6).Since metric invariance was established; analysis proceeded to appraising structural covariance invariance for MS1 and MS2. Structural covariance invariance (i.e. model C) was acknowledged since $\Delta \chi^2$ and ΔCFI for models B & C were insignificant, that is the difference of fit between the scalar and metric models was not significant.For model C: $\chi^2_{(23)} = 29.072$; for the metric model: $\chi^2_{(22)} = -26.069$; χ^2diff. $= \chi^2_{(23)} - \chi^2_{(22)} = 29.072_{(23)} - 26.069_{(22)} = 3.03_{(1)}$, *ns*. χ^2_{diff} was not significant as calculated $\chi^2_{(1)}$ < critical $\chi^2_{(1)}$, at .001; (i.e., 3.03 < 10.828). Also ΔCFI was insignificant since .005 < .02 (see table 6). As structural covariance invariance was established, the analysis progressed to gauging residual invariance (i.e. model D) for the two samples S1 and S2. Invariance of the structural covariance and residual models was recorded since $\Delta \chi^2$ and ΔCFI for models C & D were nonsignificant (*ns*). For the residual model: $\chi^2_{(29)} = 34.758$; for the structural covariance model: $\chi^2_{(23)} = 29.072$; χ^2diff. $= \chi^2_{29)} - \chi^2_{(23)} = 34.758_{(29)} - 29.072_{(23)} = 5.686_{(6)}$. Calculated $\chi^2_{(6)}$ < critical $\chi^2_{(6)}$, at .001; (i.e., 5.686 < 22.458). Also ΔCFI was 0.001 i.e. < .02 (see table 6).

Along a line parallel to that tracked for S1 and S2, the suitability of S3 and S4 for FA was established. Thenceafter, temporal invariance of the OCB scale was assured by proving measurement invariance across S1, S2, S3, and S4 (table 6). The bi-dimensional model was also invariant across gender, postgraduate program, marital status, merit, age, work sector, tenure and

professional category (table 6), a result that justifies carrying out mean comparisons among categories of participants' personal characteristics.

Instrument's test-retest reliability was evidenced thru detecting that $(r_{tt})_{S1-S2} = .618$ [n = 196]; $(r_{tt})_{S2-S3} = .579$ [n = 173]; and $(r_{tt})_{S3-S4}$ [n = 144] = .690, where all correlations were significant (p = .000, two-tailed).

The validated two-factor model was utilized to calculate the level of overall OCB and its two dimensions among participants in S1. Total participant overall OCB scores ranged between 24.53 to 11.71 with a median of 19.11, a mode of 21.02, a mean of 18.81± 2.468, skewness of -.317 and kutosis of -.225. The average participant overall OCB scores ranged between 1.95 and 4.09, with a mean of 3.12±.41, a median of 3.16, a mode of 3.50, skewness of -.303 and a kurtosis of -.258. Only one case out of 234 cases showed low level of overall OCB (specifically, an average participant overall OCB score of 1.95), while all other cases (i.e. 99.6%) showed moderate level of OCB (i.e. average participant overall OCB score ≥ 2 to 5.

Participant F1 scores ranged between 13.22 and 4.28, with a mean of 9.8354±1.76, median of 10.04, mode of 7.65, skewness of -.363 and kurtosis -.002. The average participant F1 scores ranged between 1.43 and 4.41, with a mean of 3.28±.58, a median of 3.34, a mode of 3.76, skewness of -.335, and a kurtosis of -.046. As regards "Civic virtue" dimension only three cases (i.e. 1.2%) trumpeted low level of F1, while all the remaining cases (i.e., 98.8%) disclosed moderate level of F1.

Participant F2 scores ranged between 11.31 and 4.46, with a mean of 8.9749±1.21, median of 9.111, mode of 8.08, skewness of -.503,and kurtosis of 1.46. As regards "Conscientiousness" dimension- only three cases (i.e. 1.2%) showed low level of F2; while all the remaining cases (i.e., 98.8%) showed moderate level of F2.

Mean average overall OCB score comparison revealed that the level of OCB among participants studying for a diploma degree ($\bar{x}\pm$ s =3.09 ±.42) was not statistically different from level of OCB among those proceeding for a master degree ($\bar{x}\pm$ s =3.18 ±.40); [t = - 1.564, p = .119, two-tailed, df = 228]. In a similar vein, it was disclosed that level of OCB among participants working for MOH ($\bar{x}\pm$ s =3.14 ±.42) was not statistically different from level of OCB of those working in other sites ($\bar{x}\pm$ s =3.10 ±.39); [t = 5.60, p = .576, two-tailed, df = 232]. Mean average overall OCB score among males ($\bar{x}\pm$ s =3.12 ±.43) was not statistically different from that among females ($\bar{x}\pm$ s =3.13 ±.41); [t = -.113, p = .910, two-tailed, df = 232]. Mean average overall OCB score among participants with an undergraduate merit excellent or very good **(**$\bar{x}\pm$ s =3.16 ±.40) was not statistically different from participants with a good or satisfactory merits **(**$\bar{x}\pm$ s =3.06 ±.42); [t = 1.89, p = .06, two-tailed, d.f=232]. Along parallel lines, mean average overall OCB revealed that married participants' OCB level ($\bar{x}\pm$ s =3.12 ±.42) was not statistically different from the unmarried **(**$\bar{x}\pm$ s =3.13 ±.40); [t = .192, p = .908, two-tailed, d.f=232]. Similarly, physicians' OCB level ($\bar{x}\pm$ s =3.13 ±.39) was not statistically different from non-physicians' **(**$\bar{x}\pm$ s =3.12 ± .48); [t = .054, p = .957, two-tailed, d.f=232]. Also there was no correlation between age and OCB score (r = -.005, p= .973), nor between tenure and OCB score (r = -.009, p= .890).

DISCUSSION

Although OCB has been studied extensively over the years in a Western context, its measurement has received relatively limited attention in other international milieus (Lievens & Anseel, 2004).The current study reconnoiters the dimensionality of OCB concept in an Egyptian situation. Eighteen items out of the 24 items of Podsakoff et al., 1990's, OCB questionnaire did not survive the screening process; a finding that could be due to the verity that OCB is heavily value-laden (Hazzi&Maldaon, 2012); discretionary (Bolino,Turnley,Gilstrap, &Suazo, 2009);contextual (Borman & Motowidlo, 1993); ill-defined and varies from one employee to another (Morrison,

1994), has various distinct shapes and forms (Zhang, 2011); with no clear-cut characterization of given acts exclusively constituting it (Brief & Motowidlo, 1986).Twenty-four acts have been mentioned by Podsakoff et al. (1990); while Brief and Motowidlo (1986) alluded to thirteen such acts. The present study pointed out six such acts.

Measuring instruments are often faction specific in the way they operate, and indicators are not expected to be identical across nations and societies (Byrne, Shavelson, & Muthén, 1898). Extraneous OCB acts can bring about measurement trepidations and irrelevant items should be excluded so that conceptual clarity is conserved. Construct calrifty is not a sufficient condition for psychometric soundness; rather it is a necessary condition that can not be forfeited (Organ, 1997).

OCB has undergone subtle definitional revisions since the term was coined in the late 1980s; however the construct remains the same at its core. OCB refers to anything that employees choose to do, spontaneously and of their own accord, which often lies outside their stipulated job descriptions (Werner, 1994). OCB cannot be prescribed or required in advance for a given job (Katz & Kahn, 1966).According to Organ et al. (2006), the cultural context may influence how OCB is perceived in different cultural frameworks and whether employees are inclined to demonstrate OCB in various situations. It can not be overlooked that Eastren working conditions and culture are different from the West (Jena &Goswami, 2014).

Sundry earlier researches have publicized that culture and work condition decidedly impact OCB (Gautam, Dick, Wagner, Upadhyay, & Davis, 2005). As Podsakoff et al. (2000) brought to light that cultural context could affect the forms and factor structure of OCB and that research on OCB measurement in contexts other than Western ones is important because the dimensionality of an OCB measure could readily vary contingent upon the cultural context (Lievens & Anseel, 2004). Then, this study contributed to the sprouting number of international studies on OCB by investigating the dimensionality of OCB measure through EFA and CFA in an Egyptian scenery.

The present study corroborated a bi-dimentional structure of OCB comprised of "Civic virtue" and "Conscientiousness". "Civic virtue"—refers to behaviors that indicate responsible participation in the political process of the organization and represents a macro-level interest in the organization as a whole. Examples of civil virtue include, attending meetings, joining voluntary functions, and keeping abreast of organizational issues (Jena & Goswami, 2014). The second dimension of OCB relates to "Conscientiousness", which incorporates instances such as following timely breaks, punctuality,watchfulness about how one's behavior affects others, and conservation of resources, including time (Dimitriades, 2007). Conscientiousness behavior of health workers such as physicians, dentists, pharmacists, and nurses would make them avoid casual talks or to lengthy personal telephone calls and make them attend patients on time and perform their duties as required (Chahal& Mehta, 2010).

Results obtained in the present study indicate that the dimensions of OCB, hypothesized by Podsakoff et al. (1990), are only partially found. This finding is comparable to previous studies (Argentero et al., 2008; Petitta, Borgogni, Mastrorilli, & Scarpa, 2004 as cited by Argentero et al., 2008). Actually the bi-dimensional model has been previously pronounced by copious studies (e.g., Bachrach, Bendoly, & Podsakoff, 2001; Perrone & Chiaccherini, 1999, cited by Argentero et al., 2008; Podsakoff et al., 1990; Smith, et al.,1983; Van Scotter & Motowidlo, 1996; Williams & Anderson ,1991). In the context of the present study, it is notable that group heterogeneity could have contributed to the survival of mere six indicators and the subsequent extraction of just two factors. It is observable that the level and variability of scores can differ from one group of people to another; and that psychometric properties of the questionnaire can be affected by group heterogeneity or by systematic selection of participants (Allen &Yen, 2013). Again, Allen and Yen contend that selection occurs frequently on high school admission, job hiring, and subject assortment for research studies, and it is important to be mindful of the effects of selection and group heterogeneity on the reliability and validiy of an instrument.

In the present study the two OCB subscales that have been extracted were found to be moderately correlated, a resultthat is coherent with prior literature findings which established that correlations between various OCB dimensions ranged from .40 to .86 (Bachrach et al., 2001; LePine et al.,2002; Perrone&Chiaccherini, 1999, cited by Argentero et al, 2008 ; Podsakoff et al., 1990).Therefore the present study substantiates earlier studies in other global contexts and imparts a general portrait that forms and structure of OCB in an Egyptian context holds relatively well vis-à-vis other transnational settings. However, the relatively unimpressive internal consistency reliability of F2 subscale (Chronbach's α of .556) could be attributed to group heterogeneity and small number of indicators.

In addition, the study settled the invariance of OCB measure across four different samples, and across various sociodemographic characteristics such as age, gender, marital status, profession, work sector, undergraduate merit and postgraduate program. Temporal invariance was also established by way of verifying measure invariance across four samples taken at four discrete occasions. Although this study found clear support for the discriminant validity of two dimensions, convergent validity was not very well ratified for F2 as its (ρc) was .557. Nonetheless, this issue has been faced by previous OCB research and was ascribed to factors being measured by small number of manifest variables as many items did not survive the screening process (Lievens & Anseel, 2004).

For the measurement model, tau-equivalence was established while the condition of parallelism was not; and weighted indicator scores were applied to assess the level of OCB and its dimensions among study participants. Calculations revealed that almost all participants displayed moderate levels of OCB in sync with its two dimensions "Civic virtue" and "Conscientiousness". Exhibiting comparable levels on the two dimensions is logical as long as the two factors are moderately positively correlated. Today, while some workers demonstrate extra discretionary

contributions to their job by going beyond the working obligations prescribed by their jobs, others choose to withhold such work behaviours when such behaviour does not attract direct or indirect benefit (Jena &Goswami, 2014). Generally, organizations are now lacking proactive human resource management (HRM) approaches to foster OCB and signals of impending organizational failure have become obvious recently (Yen &Niehoff, 2004). The belief among HRM theorists is that as more employees engage in OCB, the organization becomes more successful (Yen & Niehoff, 2004).According to Wagner and Rush (2000), the dimensions of OCB have an accumulative positive effect on the organization's functioning.

By definition, OCB is willing, consensual and spontaneous employee behavior that is vital for organizational effectiveness ((Barnard, 1983; Podsakoff&MacKenzie, 1997). Managers need to support the socio-psychological framework conducive to an environment resonant with OCB (Todd & Kent, 2006). OCB research has now expanded to a variety of different domains, including HRM, marketing, leadership and strategic management (Podsakoff et al., 2000).

Considering the significance of OCB, an essential emerging question is, what can organizations do in order to increase its level of OCB? Quite a lot of studies indicated that there is a need to explore the influence of socio-demographic factors on OCB (Chahal& Mehta, 2010).

With the widespread belief, that OCB is critical to enhance organizational effectiveness, understanding the antecedents of OCB has been of immense interest so as to enhanceOCB (Jahangir, Akbar &Haq, 2004). A recurrent query in organizational behavior research is whether employees' personal (sociodemographic) characteristics would significantly predict OCB (Jena & Goswami, 2014). A typical answer to this question is that associations between OCB and personal variables is either weak (Organ & Ryan, 1995), inconsistent (Jena &Goswami, 2014), inconclusive (Organ &Konovsky, 1989), or non-existent (Organ, 1994). The present study found no significant association between employees' personal characteristics and level of OCB. This finding may be

attributed to relative group homogeneity pertaining to the fact that almost all of participants demonstrated moderate OCB levels. However, the association between merit and OCB would be significantly positiveif it were examined at 90% level of significance and future studies are recommended to be specifically designed to further explore merit's association with OCB. At this junction, it could be recounted that research findings are not conclusive apropos the relationship between OCB and educational level. Some studies found a positive relationship (Gregerson, 1993; Smith et al., 1983 and some did not (Organ & Konovsky, 1989). Establishing a relationship between OCB and educational level has important managerial implications, as human resource mananagement practices could be arranged to raise the chances of selecting employees who are more personally inclined to engage in OCB (Zhang, 2011).

The present study is a step in the proper direction since it fills a lacuna in research on dimensions, measurement, and individual antecedents of OCB in a non-Western context. It is important for mamagers to guage OCB and depict its personal determinants so as to boost higher OCB levels in their organizations. Managers can enhance OCB by motivating employee to engage in extra-role behaviors through direct and indirect benefits. Test-retest reliability and temporal invariance of the OCB assessment tool purports that it can be administred across time to monitor and assess the effectiveness of OCB interventive programs. Evaluation of OCB takes place before and after interventions so as to assess whether there has been a positive impact on the levels of OCB in the workplace (Zhang, 2011).The evaluation component is critical if interventions are being implemented, especially if these interventions involve costs (e.g. posters, office functions).

The depicted model is of potential value to managers as it conceptualizes the level of OCB as a multiple-observation criterion that is conducive to formulating a behavior-based strategy beneficial to promoting health workers' OCB that is consequential to improving the overall performance of healthcare delivery systems (Han et al., 2018).

Future research is needed to address the question whether the measurement of OCB on only two dimensions is a limitation of Podsakoff et al.'s (1990) scale or is due to the nature of OCB in a specific cultural context. Thus, in conjuction with previous researches (e.g. Organ, et al., 2006; and Podsakoff et al., 2000), the present piece of research pronounces a future need to examine the potential impact of cultural context on OCB. The present study represents OCB of a specific population of a specific region and its generalizability is limited to the study situation. Future studies need to be replicated on a wider scale so as to verify the external validity of the bi-factorial model of OCB retrieved in the present study.

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TABLES

Table 1. Personal characteristics of participants in the initial study (S1) [N1= 238] and cross-validation study (S2) [N2=208]

	N1	%	N2	%		
Gender					$\chi^2_{(1)}$= .015	No statistically significant
Females	175	73.5	154	74	, p = .903, two-	difference between S1 & S2
Males	63	26.5	54	26	sided)	
Age (Years)					N1	N2
22-	112	47.1	91	43.8	Maximum = 57	Maximum = 57
30-	107	44.9	99	47.6	Minimum = 22	Minimum = 22
40-	16	6.6	15	7.2	Median =30	Median =30
50-60	3	1.2	3	1.5	Mode = 25	Mode = 27
					$\bar{x}\pm$ s = 31± 6.04	$\bar{x}\pm$ s = 31.36± 6.09 [a]
Marital Status					$\chi^2_{(1)}$= .396	No statistically significant
Unmarried	105	44.1	86	41.3	, p = .529,	difference between S1 & S2
Married	133	55.9	122	58.7	two-sided)	
Program						
Diploma	145	60.9	131	63.0	$\chi^2_{(1)}$= .007	No statistically significant
Master	93	39.1	77	37.0	, p = .935,	difference between S1 & S2
					two-sided)	
Undergraduate merit						
Excellent	30	12.6	24	11.5	$\chi^2_{(3)}$= .174	No statistically significant
Very Good	115	48.3	102	49.0	, p = .982,	difference between S1 & S2
Good	70	29.4	64	30.8	two-sided)	
Satisfactory	20	8.4	16	7.96		
Not mentioned	3	1.3	2	0.96		
Work Sector						
Ministry of Health	154	64.7	143	68.6	$\chi^2_{(3)}$= 1.754	No statistically significant
Private	41	17.2	36	17.3	, p = .625,	difference between S1 & S2
University	35	14.7	22	10.6	two-sided)	
Others	8	3.4	7	3.4		
Profession						
Physician	135	56.7	117	56.3	$\chi^2_{(5)}$= .803	No statistically significant
Pharmacist	48	20.0	46	22.1	, p = .977,	difference between S1& S2
Dentist	11	4.6	10	4.8	two-sided)	
Nursing	13	5.5	9	4.3		
Nutritionist	11	4.6	11	5.3		
Others	20	8.4	15	7.2		
Tenure					N1	N2
.33-	92	38.7	92	38.70	Maximum = 31	Maximum = 31
5-	74	31.1	74	35.58	Minimum = .33	Minimum = .33
10-	63	26.4	63	30.29	Median = 6	Median = 6
20-31	9	3.6	9	4.33	Mode = 5	Mode = 5
					$\bar{x}\pm$ s =7.14± 5.85	$\bar{x}\pm$ s =7.49± 5.86 [b]
Graduation Year					N1	N2
1984-	4	1.7	4	2.0	Earliest = 1984	Earliest = 1984
1995-	76	31.9	71	34		
2010-2019	158	66.3	133	64	Latest = 2019	Latest = 2019

a- Statistically insignificant difference between mean age of the two samples (t = -.685, df = 444, P = .494, two-tailed).
b- Statistically insignificant difference between mean tenure of two samples (t = -.626, df = 444, P = .531, two-tailed).

Table 2. Exploratory factor analysis for 6-itemed dataset of the initial study (S1)

Factor	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings [a]	Simulated Eigenvalues in Parallel Analysis [b]
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	$\bar{x} \pm s$
1	2.249	37.482	37.482	1.649	27.480	27.480	1.455	1.2173 ± .0525
2	1.129	18.821	56.303	.555	9.251	36.731	1.219	1.1127 ± .0362
3	.820	13.674	69.977					1.0315 ± 1.0794
4	.711	11.843	81.819					0.9601 ± .0302
5	.604	10.071	91.891					0.8854 ± .0344
6	.487	8.109	100.000					0.7929 ± .8631

a. When factors are correlated, sums of squared loadings cannot be added to obtain a total variance.

b. Averaged variances of simulated eigenvalues, their standard deviations using normally distributed random numbers for 6 variables in a sample size of 234 and 500 replications in parallel analysis.

Extraction method: Principle Axis Factoring (PAF); Rotation method: Promax with Kaiser normalization. Nineteen iterations were required for the unrotated solution to converge.

Table 3. Pattern matrix for the six observed variables of the Organizational Citizenship Behavior measurement modelfor the initial study S1

Indicator	Unrotated solution		Rotated solution	
	Factor 1 Civic Virtue	Factor 2 Contentiousness	Factor 1 Civic Virtue	Factor 2 Contentiousness
A9	.499	-.071	.411	
A11	.670	-.374	.793	
A12	.590	-.254	.633	
A20	.479	.481		.712
A21	.338	.211		.372
A24	.510	.263		.506

Extraction method: Principle Axis Factoring (PAF); Rotation method: Promax with Kaiser normalization.Rotation converged in 3 iterations.

Table 4. Unstandarized and standarised regression weights for the measurement model (Cross-validation study S2)

Regression line	Unstandardized estimate	S.E.	C.R.	P	Standardized estimate	Squared multiple correlation
F1 --->OCB9	.783	.086	9.006	***	.670	.449
F1 --->OCB11	.731	.081	8.981	***	.664	.441
F1 --->OCB12	.753	.080	9.393	***	.692	.479
F2 --->OCB20	.590	.090	6.533	***	.535	.335
F2 --->OCB 21	.600	.102	5.869	***	.482	.286
F2 --->OCB 24	.593	.075	7.883	***	.656	.430

*** The regression weight is significantly different from zero at the 0.001 level (two-tailed).

Table 5. Standardized residual covariances of the measurement model of the initial study S1

	OCB24	OCB21	OCB20	OCB12	OCB11	OCB9
OCB24	.000					
OCB21	-.657	.000				
OCB20	.449	.179	.000			
OCB12	.331	.275	-.202	.000		
OCB11	-.659	.722	-1.598	.345	.000	
OCB9	.472	.504	.260	-.470	.151	.000

Table 6. Organizational Citizenship Behavior measurement model invariance tests across two samples (S1 & S2), four samples (S1, S2, S3, S4), and participants' personal characteristics

Type of Invariance	χ^2 (*df*, *P*)	CFI	TLI	RMSEA (90%CI; P-close)	$\Delta\chi^2$	ΔCFI
Two samples (S1, S2)						
Configural	18.594 (16, .290)	.994	.988	.019 (.000, .050; .950)	----	----
Full metric	26.069(22, .249)	.990	.996	.021 (.000, .047; .972)	7.475 ns	0.004 ns
Structural covariance	29.072(23, .178)	.985	.991	.024 (.000, .049; .960)	3.003 ns	0.005 ns
Full residual	34.758(29, .213)	.986	.995	.021 (.000, .044; .985)	5.686ns	0.001 ns
Four samples						
Configural	99.243 (58, .001)	.956	.954	.030 (.019, .040; 1.000)	----	----
Full metric	105.252 (64, .001)	.956	.958	.028 (.018, .038; 1.000)	6.0097 ns	0.000 ns
Structural covariance	105.473 (65, .001)	.956	.960	.028 (.018, .037; 1.000)	0.221 ns	0.000 ns
Full residual	113.156 (91, .000)	.955	.962	.027 (.017, .036; 1.000)	7.683 ns	0.001 ns
Gender (S1)						
Configural	16.815 (16, .398)	.995	.991	.015 (.000, .063; .851)	----	----
Full metric	19.669 (22, .604)	1.000	1.000	.000 (.000, .048; .959)	2.2854 ns	0.005 ns
Structural covariance	19.952(23, .645)	1.000	1.000	.000 (.000, .045; .969)	0.317 ns	0.000 ns
Full residual	34.142 (29, .234)	.971	.970	.028 (.000, .060; .856)	14.19 ns	0.001 ns
Program (S1)						
Configural	14.640 (16, .551)	1.000	1.000	.000 (.000, .056; .918)	----	----
Full metric	20.394 (22, .558)	1.000	1.000	.000 (.000, .050; .949)	5.754 ns	0.000 ns
Structural covariance	22.320 (23, .645)	1.000	1.000	.000 (.000, .052; .937)	1.926ns	0.000 ns
Full residual	28.388 (29, .497)	1.000	1.000	.000 (.000, .049; .957)	6.68 ns	0.000 ns
Marital status (S1)						
Configural	18.730 (16, .283)	.986	.973	.027 (.000, .069; .775)	----	----
Full metric	31.246 (22, .091)	.952	.934	.043 (.000, .074; .612)	12.516 ns	0.034 ns
Structural covariance	33.947 (23, .066)	.943	.925	.045 (.000, .076; .563)	2.701ns	0.009 ns
Full residual	43.651 (29, .040)	.924	.921	.047 (.011, .074; .548)	9.704 ns	0.019 ns
Merit (S1)						
Configural	13.547 (16, .632)	1.000	1.000	.000 (.000, .051; .943)	----	----
Full metric	16.115 (22, .810)	1.000	1.000	.000 (.000, .035; .989)	2.568 ns	0.000 ns
Structural covariance	16.308 (23, .842)	1.000	1.000	.000 (.000, .032; .993)	0.193ns	0.000 ns
Full residual	25.111 (29, .672)	1.000	1.000	.000 (.000, .041; .983)	8.803 ns	0.000 ns
Age(S1)						
Configural	21.485 (16, .161)	.970	.944	.038 (.000, .077; .646)	----	----
Full metric	30.660 (22, .103)	.953	.936	.041 (.000, .073; .636)	9.175	0.017 ns
Structural covariance	21.203 (23, .096)	.950	.935	.042 (.000, .073; .634)	9.457	0.003 ns
Full residual	34.253 (29, .230)	.971	.970	.028 (.000, .060; .653)	13.05	0.019 ns
Work sector (S1)						
Configural	16.249 (16, .436)	.999	.997	.008 (.000,.062; .871)	----	----
Full metric	21.519 (22, .489)	1.000	1.000	.000 (.000, .053; .930)	5.27ns	.001ns
Structural covariance	21.521 (23, .549)	1.000	1.000	.000 (.000, .050; .950)	.002 ns	.000 ns
Full residual	32.388 (29, .230)	.982	.982	.022 (.000, .057; .895)	10.867 ns	.018 ns

Table 6: Continued:

Type of Invariance	χ^2 (*df*, *P*)	CFI	TLI	RMSEA (90%CI; P-close)	$\Delta\chi^2$	ΔCFI
Tenure (S1)						
Configural	20.157 (16, .213)	.987	.976	.026 (.000, .056; .897)	----	----
Full metric	22.480 (22, .431)	.999	.998	.007 (.000, .043; .987)	2.323ṉ	.012 ṉ
Structural covariance	22.575 (23, .486)	1.000	1.000	.000 (.000, .040; .990)	.095ṉ	.001 ṉ
Full residual	23.349 (29, .760)	1.000	1.000	.000 (.000, .028; .999)	.774 ṉ	.001 ṉ
Profession(S1)						
Configural	17.332 (16, .364)	.993	.986	.026 (.000, .065; .832)	----	----
Full metric	24.177 (22, .338)	.988	.983	.007 (.000, .060; .868)	6.845ṉ	.005 ṉ
Structural covariance	24.240 (23, .391)	.993	.991	.000 (.000, .057; .900)	.063ṉ	.005 ṉ
Full residual	26.266 (29, .611)	1.000	1.000	.000(.000, .044; .976)	2.026 ṉ	.007 ṉ

Abbreviations: χ^2= Chi-square; *df*= Degrees of freedom; CFI = Comparative Fit Index; TLI = Tucker-Lewis Index; CI = Confidence Interval; RMSEA = Root Mean Square Error of Approximation; ṉ = non-significant change at .001 probability level; ṅ = significant change at .001 probability level, (S1) = Initial sample N.B. Four samples S1, S2, S3, & S4 were taken one month apart over a period from 29/9/2019 till 16/1/2020.

N.B. Program was either diploma or master.

N.B. Merit was categorized into two groups one for "excellent" and "very good" and one for the remainder.

N.B. Age was categorized into two categories one for those below 30 and other for the remainder.

N.B. Work sector was categorized into two categories one for working in Ministry of Health and one for the remainder.

N.B. Tenure was categorized into two categories one for those with less than ten years and one for the remainder.

N.B. Profession was categorized into two groups one for physicians and the other for non-physicians.

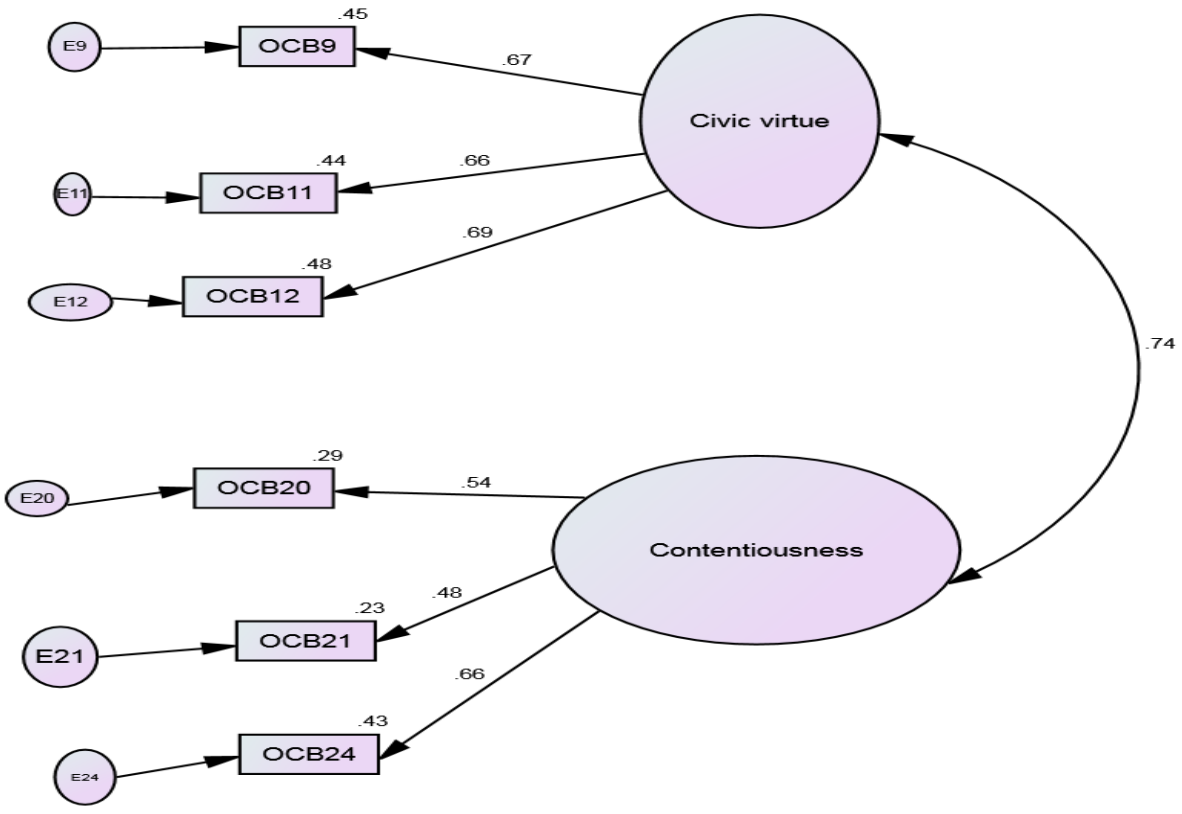

Figure 1. Two-factor Measurement Model of Organizational Citizenship Behavior with Standarised Estimates